Soil Treatability Study

Energy Technology Engineering Center • U.S. Department of Energy

Glossary of Terms

Assay: A laboratory procedure that measures or detects something.

Bioaugmentation: Adding non-native bacteria or fungi to contaminated soils to degrade the chemicals that are present.

Biodegradation: Biological break down of chemicals in the environment. Biodegradation typically converts organic chemicals into different forms until the chemical becomes carbon dioxide and water. The different forms of the chemical as it is being broken down are called "degradation products".

Bioremediation: A remediation method of using microorganisms to break down chemicals. Bioremediation can use either biostimulation or bioaugmentation methods to increase break down rates.

Biostimulation: Stimulating microorganisms already present in soil so they can either a.) break down chemicals or b.) break down chemicals faster. Common biostimulation methods include soil aeration and adding nutrients, oxidizing agents, bulking agents (to promote soil aeration), or surfactants.

Chelating agent: A chemical additive that can increase the ability of plants or microorganisms to take up or break down chemicals in soils.

Germination: Growth of a plant from a seed.

Homogenization: Mixing soil so it has the same properties and chemical concentrations throughout it.

Metagenomics: The genetic analysis of DNA extracted directly from field soil samples. Metagenomics determine what microorganisms are present in the soil sample and in what quantities.

Microbial community: The bacteria and fungi living together in a given environment, like soil.

Microcosm: A miniature, isolated environment that mimics the conditions of a larger environment, but under controlled conditions.

Microorganism: A microscopic organism, such as a bacteria or fungi.

Natural attenuation: Reduction of chemical concentrations in the environment under natural site conditions. This reduction can be caused by microorganisms, plants, or environmental weathering (e.g., sun exposure).

Phytoremediation: The processes of using plants to remediate chemicals from soil or groundwater.

Propagation: Producing plants by planting seeds or cuttings.

Sterilization: Eliminating microorganisms in a soil sample so microbial activity stops. One common method of sterilization is gamma irradiation.

Terminal Restriction Fraction (TRFLP) Analysis: A method of analyzing mixtures of DNA from soil or water samples. TRFLP provides an estimate of the relative amount of microorganisms in the sample. TRFLP is one way that we check the results of the metagenomics analyses.

Weathering: A natural process that occurs when a chemical in soil is exposed to environmental and biological conditions over a long period of time. Weathering can reduce chemical concentrations or change their chemistry.